

**FACT SHEET FOR NPDES PERMIT NO. WA0022667
TOWN OF CATHLAMET**

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 Revised Code of Washington (RCW) which defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This permit is issued to selected minor dischargers that, based on the available information, the Department believes have a relatively low environmental impact potential. The permit contains the technology-based effluent limitations as given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). Due to a lack of adequate data indicating the discharger's potential for exceedance of the water quality standards, this permit does not include water quality-based numeric effluent limitations. However, a preliminary assessment of the discharge's potential for exceedance of the water quality standards for chlorine and ammonia is made. Based on this preliminary evaluation, the permit may include monitoring requirements and/or measures to control discharges of these toxic pollutants.

One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures).

This fact sheet has been reviewed by the Permittee and errors in fact have been corrected. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments (Appendix C) will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix C--Response to Comments.

GENERAL INFORMATION

Applicant:	Town of Cathlamet
Facility Name and Address:	Cathlamet Sewage Treatment Plant 390 2nd Street Cathlamet, Washington
Type of Treatment:	Aerated Lagoon System
Discharge Location:	Columbia River Latitude: 46° 12' 20" N Longitude: 123° 23' 15" W.
Water Body ID Number:	WA-CR-1010

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

1. Treatment Processes: Two aerated lagoons followed by one stabilization pond and a chlorine contact chamber.
2. Treatment Plant Classification: Class I.
3. Industrial Users: According to the information provided by the applicant, there are no major industrial contributors to the applicant's sewer collection system.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Columbia River which is designated as a Class A receiving water in the vicinity of the outfall. Characteristic uses include the following:

Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce; and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

DISCHARGE OUTFALL AND DILUTION

Secondary treated and disinfected effluent is discharged from the facility via an outfall 200 feet from the shore and 20 feet below water surface into the Columbia River.

A preliminary estimate of the acute dilution factor was made for this discharge based on the allowable percent flow of the receiving water using the following formula:

$$\text{acute dilution factor} = [Q_{\text{effluent}} + 2.5\% Q_{\text{stream}}] / (Q_{\text{effluent}})$$

where, Q_{effluent} = effluent flow during critical condition, 0.4229 MGD; and,

Q_{stream} = receiving water flow.

Based on the above formula, the estimated acute dilution factor will be greater than 50 if the river flow exceeds 980 MGD (i.e., 1500 cfs). The Columbia River 7Q10 flows at the discharge location is expected to be in the tens of thousands cfs, which is a much greater flow than is needed for 50 times dilution.

PERMIT STATUS

The previous permit for this facility was issued on January 28, 1980. The previous permit placed effluent limitations on five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria.

An application for permit renewal was submitted to the Department on May 10, 1995, and accepted by the Department on January 16, 1997.

PERMIT COMPLIANCE HISTORY

Cathlamet has a history of report submittal violations. Since the permit was issued on January 28, 1980, several discharge monitoring reports have been submitted either late or incomplete. Annual Infiltration and Inflow reports, except for the period of April 1994 to May 1995, have not been submitted.

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The plant has exceeded permitted biochemical oxygen demand and fecal coliform limitations intermittently throughout the past two permit cycles and often exceeds the effluent flow limitation of .2 mgd during the wet months of the year. Since the new permitted design criteria sets the average flow for the maximum month at 0.135 mgd, the facility must begin the planning necessary as required in permit condition S4. The compliance schedule for meeting this requirement must be included in the final permit issued.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Annual Average</u>	<u>Lowest Monthly Average</u>	<u>Highest Monthly Average</u>
Flow (MGD)	0.1565	0.0573	0.4229
BOD ₅ (mg/L)	21	4	47
TSS (mg/L)	25	5	59
Fecal Coliform (colonies per 100 mL)			197
Total Residual Chlorine (mg/L)	0.13	0.07	0.26
Temperature, Winter (degree Celsius)	9	6	14
Temperature, Summer (degree Celsius)	19	14	21
pH range		low pH = 7.1	high pH = 9.2

PROPOSED PERMIT LIMITATIONS AND CONDITIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), or Sediment Quality Standards (Chapter 173-204 WAC). The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

DESIGN CRITERIA

In accordance with WAC 173-220-130(1)(a), effluent limitations shall not be less stringent than those based upon the design criteria for the facility, which are contained in approved engineering plans, reports, or approved revisions. Also, in accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are as follows:

Table 2: Design Standards for Cathlamet WWTP.

Parameter	Design Quantity
Monthly average dry weather flow (MGD)	0.135
BOD influent loading (lb./day)	270
Design population equivalent (# of people)	1350

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The permit requires that chlorine concentrations in excess of that necessary to reliably achieve the fecal coliform limits shall be avoided. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after 15 minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. This concentration shall be used as a guideline for minimizing chlorine usage.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state.

Due to a lack of adequate data indicating the discharger's potential for exceedance of the water quality standards, this permit does not include water quality-based numeric effluent limitations. Also, in the absence of data indicating otherwise, the discharge is believed to have a relatively low environmental impact potential, and therefore, the permit does not have extensive effluent and receiving water data gathering and monitoring requirements. However, a preliminary assessment of the discharge's potential for exceedance of the water quality standards for chlorine and ammonia are made. Based on this preliminary evaluation, described in the following section, the permit may include monitoring and measures to control discharges of these toxic pollutants.

Consideration of Surface Water Quality-Based Criteria:

Critical Conditions:

Determination of the reasonable potential for exceedance of the surface water standards quality standards are made for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

Mixing Zones:

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART), and in accordance with other mixing zone requirements of WAC 173-201A-100.

Preliminary Dilution Factor Estimation:

When pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART, mixing zones may be authorized in accordance with Chapter 173-201A WAC.

Mathematical models and/or dye studies may be used to determine the dilution factors of effluent to receiving water that occur within the allowable mixing zones at the critical condition. The dilution factors determined will then be compared with those based on the allowable river flow percents (WAC 173-201). RIVPLUM4 model may be used to determine the dilution factors at the boundaries of the allowable mixing zone. RIVPLUM4 is a two dimensional model based on the assumption that the discharge is a single point source and is completely and rapidly mixed vertically in the receiving river. Under most discharge conditions, dilution factors estimated by the percent method are more conservative (i.e., are less) than those predicted by RIVPLUM4. Since adequate data is lacking for the dilution factors determination for this discharge, a preliminary estimate of the dilution factors based on the allowable percent flow of the receiving water was made for this discharge.

Chlorine Considerations:

Discharges from wastewater treatment plants that use chlorine for coliform control are likely to have a reasonable potential for chlorine toxicity, unless dechlorination or other chlorine control methods are practiced at the plant and there is adequate dilution of the effluent by the receiving water.

Based on the preliminary estimate of the dilution factor (320), the discharge from this facility does not have a reasonable potential for exceedance of the water quality chlorine standards outside the allowable mixing zone. The permit requires that the Permittee shall not use chlorine concentrations in excess of that necessary to reliably achieve coliform limits in the permit.

Ammonia Considerations:

A reasonable potential determination for exceedance of the ammonia criteria caused by this discharge cannot be made without adequate data on the ammonia concentration in the effluent and data on the flow, temperature, pH, and ammonia concentration in the receiving water under the critical condition. Calculations of the ammonia criteria under various conditions suggest that there is no reasonable potential for exceedance of the water quality standards when the receiving water pH and temperature are below 8 and 68 °F (20 °C), respectively, and the acute dilution factor is greater than 10. However, as the background ammonia nitrogen concentration in the receiving water increases to 0.5 mg/L or higher, the reasonable potential analysis suggests the exceedance of the chronic ammonia criteria. If there are indications of high receiving water pH, temperature, or ammonia, the permit will require extensive ambient flow and water quality monitoring and/or implementation of immediate measures for control of ammonia in the discharge.

Based on the preliminary estimate of the dilution factor, the discharge from this facility does not have a reasonable potential for exceedance of the ammonia criteria outside the allowable mixing zone in the receiving water.

MONITORING AND REPORTING

Effluent monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

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The monitoring and testing schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department Permit Writer's Manual.

The permit may require additional monitoring to determine the reasonable potential for exceedance of the ammonia criteria. The parameters to be monitored may include the ammonia concentration in the effluent, and the receiving water ammonia concentration, pH, and temperature.

OTHER PERMIT CONDITIONS

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S4 to plan expansions or modifications before existing capacity is reached, and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is regulated by the jurisdictional health department.

OUTFALL EVALUATION

Proposed permit Condition S9 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers.

EFFLUENT MIXING STUDY

If needed, the Permittee may be required to more accurately determine the mixing characteristics of the discharge in Condition S10. Mixing will be measured or modeled under conditions specified in the permit to assess whether assumptions made in the permit will protect the receiving water quality outside the allotted dilution zone boundary.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REVIEW BY THE PERMITTEE

A proposed permit was reviewed by the Permittee for verification of facts. Only factual items were corrected in the draft permit and fact sheet.

APPENDIX B -- GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural, and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Class 1 Inspection--A walk-through inspection of a facility that includes a visual inspection and some examination of facility records. It may also include a review of the facility's record of environmental compliance.

Class 2 Inspection--A walk-through inspection of a facility that includes the elements of a Class 1 Inspection plus sampling and testing of wastewaters. It may also include a review of the facility's record of environmental compliance.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Daily Maximum Discharge Limitation--The greatest allowable value for any calendar day.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of rainfall-caused surface water drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

Monthly Average Discharge Limitation--The average of the measured values obtained over a calendar month's time.

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington state permit writers are joint NPDES/State permits issued under both state and federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

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APPENDIX C -- RESPONSE TO COMMENTS